# <sup>™</sup>Cortosion Report



0955-007-001 Remaining Life (Years) 3.31 **Equipment Location ID** C-1100 NO. 4 SIDECUT OUTLET Equip. Location Descrip. Retirement Date 05/30/2015 02/06/2012 **Last Inspection Date** 10/02/2013 **Next Inspection Date** 39.27 **Current Corrosion Rate** CCR DP MEAS DP DP DT BASE MEAS MEAS **MEAS** NEAR LAST MIN REM LIFE ID METH STAT SZTYPE 5 4 3 VALUE 003.R RT Α 8.00 ELL 0.270 0.280 0.270 0.280 0.180 0.100 9.22 8.68 04/01 02/12 04/88 04/95 05/98 004.R RT A 8.00 ELL 0.290 0.310 0.310 0.290 0.320 0.220 0.100 9.22 13.02 04/88 04/95 05/98 04/01 02/12 11/77 005.R RT Α 10.00 PIPE 0.170 0.140 5.00 6.00 02/12 RT PIPE 0.350 0.340 006.R Α 0.330 0.320 0.340 0.270 0.140 6.45 20.15 10.00 02/12 11/77 05/92 05/98 04/00 04/01 RT ELL 0.210 0.140 5.00 14.00 007.R Α 10.00 02/12 0.322 008.R RT Α 8.00 PIPE 0.322 0.322 0.170 0.100 16.29 4.30 02/12 10/02 10/02 01/76 RT PIPE 0.322 0.260 009.R Α 0.322 0.200 0.100 1.72 93.13 8.00 10/02 02/12 01/76 11/11 RT PIPE 0.322 0.322 0.240 0.240 0.100 2.27 010.R 61.62 Α 8.00 01/76 10/02 11/11 02/12 011.R RT PIPE 0.322 0.322 0.190 0.290 0.140 0.89 169.30 Α 8.00 01/76 10/02 11/11 02/12 0.322 0.350 012.R RT Α 8.00 PIPE 0.322 0.290 0.140 0.00  $\infty$ 01/76 10/02 02/12 11/11 RT 0.322 0.322 0.280 0.270 013.R Α 8.00 PIPE 0.140 39.27 3.31 01/76 10/02 11/11 02/12 014.R RT Α 8.00 PIPE 0.270 0.140 5.00 26.00 02/12 015.R RT Α 8.00 PIPE 0.270 0.140 5.00 26.00 02/12 0.290 0.140 5.00 30.00 016.R RT Α 8.00 PIPE 02/12 017.R RT Α PIPE 0.210 0.140 5.00 14.00 8.00 02/12 RT PIPE 0.200 0.140 5.00 12.00 018.R Α 8.00 02/12

0.180

02/12

Version: 8/13/2012 ©2009 Chevron Corporation

019.R

RT

Α

8.00

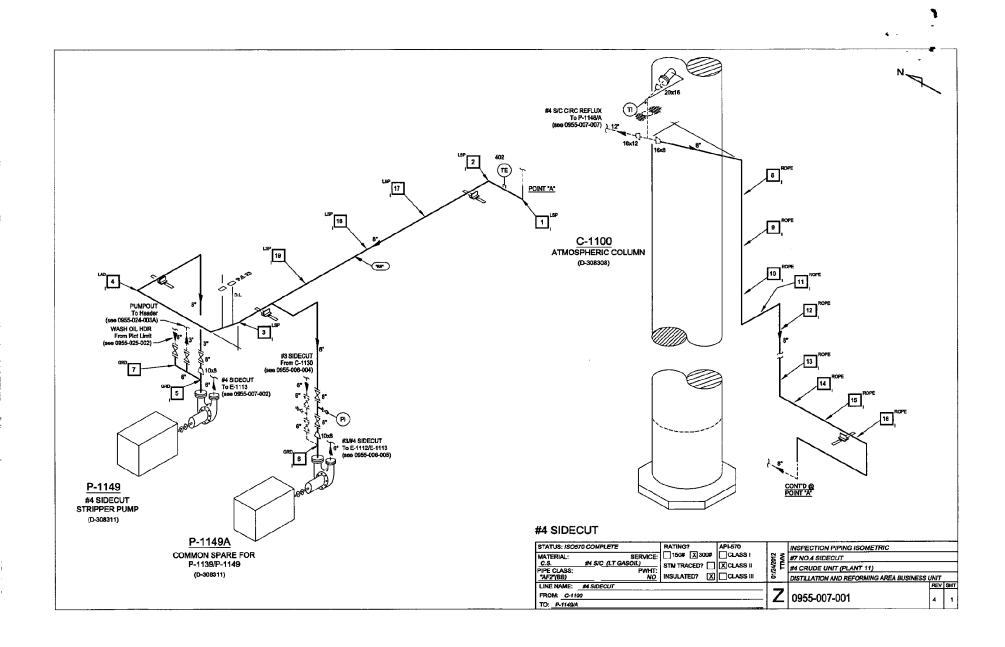
PIPE

Content Contact: Ryan Streeter Technical Contact: Ryan Streeter Page 1 of 2 Company Confidential

0.140

5.00

8.00



For Location ID: 0955-007-001 in Unit: 0955



Report Date: August 15, 2012 Data Source: Meridium

Date Available:

History Brief ID:

In- Service Date:

Reference Material:

Incident Event ID:

**Inspection Date:** 

Inspe tion Type:

Critical:

**Brief Data:** 

**Event Type:** 

Equipment ID:

Date Not Available: 11/5/2011 History Brief Date: 10/20/2011

Inspection 0955-007-001 0000110906

Asset ID: Work Order Nbr:

History Type: Asset Type:

FXD 221

Cost Center:

K.DCRRI00281

Unit:

0955 - 4 CRUDE UNIT PLT 11

Headline:

API 570 inspection

**Reliability Analysis:** 

Event Type: Cause Category: Inspection Information

Effect Category: Corrosion

Repair Location:

Temporary Repair:

Save:

Worked Performed By:

**Program Status:** 

Maintainable Item:

Permanent Repair WO:

Name: Inspected By: **TBEA TBEA** 

Pipe Wall

11/05/2011

11/05/2011

10/20/2011

Chevron Reliability

VI-1110247836

Findings:

PCA ID:

PCA-002064093

**GENERAL** 

Inspectable: Sub Item:

Part: Discussion: Condition:

Action: Location:

Damage Mechanism: PCA Work Order No:

#### **Reliability Comments:**

Information

Piping circuit inspected for sulfidation corrosion.

Corrosion rate at TML 9E is based using the nominal thickness in 2002. long term corrosion rate provides a RL of 11 years with a half life inspection during the 2016 S/D.

corrosion rate at TML 11B is based on a nominal thickness in 2002 long term corrosion rate provides a remaining life of 11 years with a half life inspection during 2016 S/D.

calculated T-min provided by DED

For the P-1149 suction piping t(min):

- 8 inch pipe:
- Pressure t(min) = 0.018 inch a.
- Structural t(min) = 0.036 inch b.
- 2. 10 inch pipe:
- Pressure t(min) = 0.022 inch
- Structural t(min) = 0.036 inch

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For Location ID: 0955-007-001 in Unit: 0955



Report Date: August 15, 2012

Data Source: Meridium

So, I would use the 0.036 inch as the ultimate t(min) for this section of pipe. If piping get below 0.100 inches, we should consider some sort of clamp or wrap. After talking to inspections, this might also be a good location for a corrosion probe.

Hope this helps,

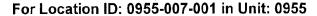
If you have any questions, please do not hesitate to contact me.

Thanks for the help, Patrick Murphy

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Report Date: August 15, 2012 Data Source: Meridium

Date Available:

History Brief ID:

In- Service Date:

Reference Material:

Incident Event ID:

Inspection Date:

Inspection Type:

Critical:

**Brief Data:** 

Date Not Available: 8/22/2007 History Brief Date: 04/10/2012 **Event Type:** Inspection

0955-007-001 Equipment ID: 0000110906

Asset ID: Work Order Nbr: History Type:

FXD 221

Asset Type: Cost Center: Unit:

K.DCRRI00281

Headline:

RFMS CUI Project

0955 - 4 CRUDE UNIT PLT 11

Reliability Analysis:

Inspection Event Type: Cause Category: Information

Corrosion

Temporary Repair:

Effect Category: Repair Location:

Save:

Worked Performed By:

**Program Status:** 

Maintainable Item:

Permanent Repair WO:

Name: Inspected By:

Pipe Wall

Chevron Reliability

08/22/2007

08/22/2007

08/22/2007

EVI

VI-1204254535

**CSAA CSAA** 

**Findings:** 

PCA ID: Condition: Inspectable: Action: Sub Item: Location:

Part: Damage Mechanism: Discussion: PCA Work Order No:

**Reliability Comments:** 

DELUGE AREA? Cooling Tower? Moderate CUI noted. RT 2 locations.

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For Location ID: 0955-007-001 in Unit: 0955



Report Date: August 15, 2012 Data Source: Meridium

Date Available:

History Brief ID:

**Brief Data:** 

**Event Type:** 

Equipment ID:

Date Not Available: 10/15/2002

History Brief Date: 10/15/2002

Inspection

0955-007-001

0000110906

Asset ID: Work Order Nbr:

History Type: FXD

221 Asset Type:

**Cost Center:** 

Unit:

K.DCRRI00281

Headline:

0955 - 4 CRUDE UNIT PLT 11

Piping u/s & d/s Of TML's RT'd For Hot H2S Corr, 1 Ell Corr, Scale Noted

Reliability Analysis:

**Event Type:** Cause Category:

Effect Category:

Inspection Information

Information

Repair Location: Temporary Repair:

Save:

Permanent Repair WO:

Name:

Inspected By:

Condition:

Maintainable Item:

Findings:

PCA ID:

PCA-002021753 **GENERAL** 

Inspectable: Sub Item:

Part:

PIPE WALL

**Discussion:** 

HB-0210080308

In- Service Date:

Critical: Reference Material:

Incident Event ID: **Inspection Date:** 

Inspection Type:

Chevron Reliability Worked Performed By:

**Program Status:** 

Pipe Wall

**JMJG** 

1

Not Resolved

Action:

Location: Damage Mechanism:

PCA Work Order No:

**Reliability Comments:** 

The straight run piping on the existing (mostly ells) TMLs was RT'd to look for hot H2S corrosion. The corrosion can occur on CS piping above 550 deg F (this line runs up to above 600 deg F). Only one section of piping (downstream of TML # 3) had internal corrosion and pitting, the piping has lost approximately 1/3 of it's original wall thickness (nominal is 0.322 for 8" Sch 40 piping). The 6" suction header branch connection has ~ 2" of scale on the bottom below the 3" pump-out piping connection. Due to the corroded ell found and the service conditions, the piping will be recommended for replacement during the next scheduled shutdown. -jmg 10/15/2002 4:13:18 PM

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Report Date: August 15, 2012 Data Source: Meridium **Brief Data:** Date Not Available: 5/22/1998 05/22/1998 Date Available: RPR-2023858 History Brief ID: History Brief Date: 05/22/1998 **Event Type:** Information In- Service Date: 05/22/1998 0955-007-001 Equipment ID: Critical: Reference Material: 0000110906 Asset ID: Incident Event ID: Work Order Nbr: **Inspection Date:** History Type: **FXD** 221 Inspection Type: Asset Type: K.DCRRI00281 Cost Center: 0955 - 4 CRUDE UNIT PLT 11 Unit: Headline: 98 OSI INSP Reliability Analysis: Worked Performed By: Chevron - General **Event Type:** Information **Program Status:** Cause Category: Information **Effect Category:** Information Maintainable Item: Other Repair Location: Permanent Repair WO: Temporary Repair: Name: DANM Save: Inspected By: **Findings:** PCA ID: Condition: Inspectable: Action: Sub Item: Location: Part: **Damage Mechanism:** PCA Work Order No: Discussion: **Reliability Comments:** 

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For Location ID: 0955-007-001 in Unit: 0955



Report Date: August 15, 2012 Data Source: Meridium

**Brief Data:** 

Date Not Available: 11/5/2011 History Brief Date: 10/20/2011 **Event Type:** Inspection

Date Available: **History Brief ID:** In- Service Date:

VI-1110247836 11/05/2011

11/05/2011

10/20/2011

Equipment ID: Asset ID:

Work Order Nbr:

0955-007-001 0000110906

Reference Material:

Incident Event ID:

Critical:

**Inspection Date:** 

**History Type:** Asset Type:

FXD 221

Inspection Type: K.DCRRI00281

Cost Center: Unit:

0955 - 4 CRUDE UNIT PLT 11

Headline:

API 570 inspection

**Reliability Analysis:** 

Inspection **Event Type:** Cause Category:

Information

Worked Performed By:

Chevron Reliability

Effect Category:

Corrosion

**Program Status:** Maintainable Item:

Pipe Wall

Repair Location:

Permanent Repair WO:

**TBEA** 

Temporary Repair:

Save:

Name:

**TBEA** Inspected By:

Findings:

PCA ID: Inspectable: Sub Item:

**Discussion:** 

Part:

PCA-002064093

**GENERAL** 

Action: Location:

**Condition:** 

**Damage Mechanism:** PCA Work Order No:

#### **Reliability Comments:**

Information

Piping circuit inspected for sulfidation corrosion.

Corrosion rate at TML 9E is based using the nominal thickness in 2002. long term corrosion rate provides a RL of 11 years with a half life inspection during the 2016 S/D.

corrosion rate at TML 11B is based on a nominal thickness in 2002 long term corrosion rate provides a remaining life of 11 years with a half life inspection during 2016 S/D.

calculated T-min provided by DED

For the P-1149 suction piping t(min):

1. 8 inch pipe:

Pressure t(min) = 0.018 inch a.

b. Structural t(min) = 0.036 inch

2. 10 inch pipe:

a. Pressure t(min) = 0.022 inch

Structural t(min) = 0.036 inch

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CUSA-CSB-0019410

For Location ID: 0955-007-001 in Unit: 0955



Report Date: August 15, 2012

Data Source: Meridium

So, I would use the 0.036 inch as the ultimate t(min) for this section of pipe. If piping get below 0.100 inches, we should consider some sort of clamp or wrap. After talking to inspections, this might also be a good location for a corrosion probe.

Hope this helps,

If you have any questions, please do not hesitate to contact me.

Thanks for the help, Patrick Murphy

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For Location ID: 0955-007-001 in Unit: 0955



Data Source: Meridium Report Date: August 15, 2012

Date Available:

History Brief ID:

In- Service Date:

Reference Material:

Incident Event ID:

**Inspection Date:** 

**Inspection Type:** 

Critical:

**Brief Data:** 

Date Not Available: 8/22/2007 History Brief Date: 04/10/2012 Event Type:

Inspection 0955-007-001 0000110906

Asset ID: Work Order Nbr:

Equipment ID:

History Type: FXD Asset Type: 221

Cost Center:

K.DCRRI00281 0955 - 4 CRUDE UNIT PLT 11

Unit:

**RFMS CUI Project** 

Headline:

**Reliability Analysis:** 

Inspection **Event Type:** Cause Category: Information

**Effect Category:** Corrosion

Repair Location:

Temporary Repair: Save:

Worked Performed By:

**Program Status:** 

Maintainable Item:

Permanent Repair WO:

Name: Inspected By: Chevron Reliability

Pipe Wall

08/22/2007 VI-1204254535

08/22/2007

08/22/2007

EVI

**CSAA CSAA** 

Findings:

PCA ID: Inspectable: Sub Item:

**Condition:** Action: Location:

Part: **Damage Mechanism:** PCA Work Order No: **Discussion:** 

**Reliability Comments:** 

DELUGE AREA? Cooling Tower? Moderate CUI noted. RT 2 locations.

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For Location ID: 0955-007-001 in Unit: 0955



Report Date: August 15, 2012 Data Source: Meridium

Date Available:

HB-0210080308

**Brief Data:** 

Date Not Available: 10/15/2002

History Brief Date: 10/15/2002

10/15/2002 History Brief ID: Inspection In- Service Date:

Event Type: Inspection In- Service Equipment ID: 0955-007-001 Critical:

Asset ID: 0000110906 Reference Material:

Work Order Nbr:

History Type: FYD Inspection Date:

History Type: FXD Inspection Date:
Asset Type: 221 Inspection Type:

Cost Center: K.DCRRI00281

**Unit:** 0955 - 4 CRUDE UNIT PLT 11

Headline: Piping u/s & d/s Of TML's RT'd For Hot H2S Corr, 1 Ell Corr, Scale Noted

**Reliability Analysis:** 

Event Type: Inspection Worked Performed By: Chevron Reliability

Cause Category: Information Program Status:

Effect Category: Information Maintainable Item: Pipe Wall

Repair Location: Permanent Repair WO:

Temporary Repair: Name: JMJG

Save: Inspected By:

Findings:

PCA ID:PCA-002021753Condition:Inspectable:GENERALAction:Not Resolved

Sub Item: Location:

Part: PIPE WALL Damage Mechanism: 1

<u>Discussion:</u> <u>PCA Work Order No:</u>

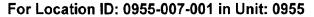
**Reliability Comments:** 

The straight run piping on the existing (mostly ells) TMLs was RT'd to look for hot H2S corrosion. The corrosion can occur on CS piping above 550 deg F (this line runs up to above 600 deg F). Only one section of piping (downstream of TML # 3) had internal corrosion and pitting, the piping has lost approximately 1/3 of it's original wall thickness (nominal is 0.322 for 8" Sch 40 piping). The 6" suction header branch connection has  $\sim 2$ " of scale on the bottom below the 3" pump-out piping connection. Due to the corroded ell found and the service conditions, the piping will be recommended for replacement during the next scheduled shutdown. -jmg 10/15/2002 4:13:18 PM

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Report Date: August 15, 2012 Data Source: Meridium **Brief Data:** Date Not Available: 5/22/1998 Date Available: 05/22/1998 RPR-2023858 History Brief Date: 05/22/1998 **History Brief ID:** Information **Event Type:** In- Service Date: 05/22/1998 0955-007-001 Critical: Equipment ID: Reference Material: 0000110906 Asset ID: **Incident Event ID:** Work Order Nbr: **Inspection Date: History Type:** FXD Asset Type: 221 **Inspection Type:** K.DCRRI00281 **Cost Center:** Unit: 0955 - 4 CRUDE UNIT PLT 11 Headline: 98 OSI INSP Reliability Analysis: Worked Performed By: Chevron - General Information **Event Type:** Cause Category: Information **Program Status: Effect Category:** Information Maintainable Item: Other Repair Location: Permanent Repair WO: Temporary Repair: Name: **DANM** Save: Inspected By: **Findings:** PCA ID: **Condition:** Inspectable: Action: Sub Item: Location: Part: Damage Mechanism: PCA Work Order No: Discussion: **Reliability Comments:** 

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